

### **REMARKS/ARGUMENTS**

Claims 1 – 26 remain in this application. Claims 1, 9, 12, 13 and 20 have been amended as suggested by the Examiner. With regard to the claims, the following is the independent/dependent status and relationship of the 26 claims.

<u>Independent</u>	<u>Dependent</u>
1	3-11
12	13-19
20	21-26

#### **1. Drawings**

Copies of the formal/informal drawings previously filed in this application are submitted with this Response, including proposed revisions marked in red for the Examiner's review and approval. Those proposed revisions include marking

To comply with the Office Action, the Drawings have been amended as indicated in the Section "Amendment to the Drawings". Copies of formal drawings are enclosed with this response. The revisions include marking Figs 1 – 3 as Prior Art, removing the instance of the second number 1 reference, and removing the shading as requested by the Examiner.

#### **2. Specification**

In the Specification, the paragraphs numbered [0032] and [0035] have been amended to indicate that "axis 9" refers to Fig.4,

#### **3. § 103 Rejections**

With regard to the § 103 Rejections, a combination of art must teach or suggest the claimed invention. That is, they must provide some teaching whereby applicants' combination would have been obvious. In *In re Gorham* [Fed. Cir, 18 USPQ2d 1885, 1888 (1991)], the court stated that "When it is necessary when it is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by applicant. [citation omitted.] 'Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching,

suggestion or incentive support the combination' [citation omitted]. . . It is impermissible, however, simply to engage in hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. [Citation omitted.]”

In the following section applicants show that the various combinations of art cited by the Examiner do not teach or suggest the claimed invention. Further, while individual elements of the claimed invention may be present in the cited art, there must be some teaching or suggestion in that art in order for the combination to render applicants' invention obvious. A bald statement that *it would have been obvious for one skilled in the art to combine A and B to make applicants claimed invention is not sufficient in the absence of any teaching or suggestion to do so.*

- A. (i) The Examiner has rejected claims 1 – 3, 5, 6, 9, and 10 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al, (“Low-Loss Design Method for a Planar Dielectric-Waveguide Y Branch: Effect of a Taper of Serpentine Shape”) in view of Tanaka, et al (“Glass Waveguide 1 X N Branching Devices”).

Regarding claim 1 and referring to the Reference, page 10 to the end of the first paragraph in the right hand column on page 11, the Reference discloses a serpentine taper from the point where the Y-junction branches into two separate legs. The legs each end in an abrupt step. Both the serpentine taper and the abrupt end step are not present in the claimed invention.

With regard to Figure 9, applicant specifically refers the Examiner to Figure 9(a) and also to Figure 10(a). As explained in the related text cited in the foregoing paragraph, Figure 10(a) represents an actual fabricated waveguide. In Figure 10(a) the sharp “vee” of the waveguide is clearly evident in contrast to the drawing of Figure 9(a) which seemed to indicate a curve at the point where separation into two legs occurs. Since the authors do not mention anything about a widened discontinuity at this point, applicant believes that this is merely an artifact of the drawing.

Figure 9(b) also compares Tsuji's serpentine taper with a linear taper and finds that the serpentine taper is superior to the linear taper. Tsuji's Figure 10(b) likewise indicates that a lower insertion loss is encountered when a serpentine taper is used as opposed to a linear taper. As applicants understand Tsuji, the

“serpentine taper is one in which the arms of the Y-branch are “wavy” as illustrated in Tsuji’s Figures 9(a) and 10(a).

In contrast to Tsuji, in applicants’ invention the arms of the Y-branch are straight and not wavy. Further, the branches have a distinct dislocations or truncations that are not found in Tsuji.

- (ii) Combining Tsuji and Tanaka likewise does not teach or suggest the claimed invention. Tanaka does not illustrate the bifurcation discontinuity of the claimed invention. It is evident from Figure 1(b) that a “Vee” is present at the point where the two legs of the waveguide separate and that the separation is continuous.

With regard to claims 2-3, 5, 6, 9 and 10, in a first instance applicants submit that these *dependent* claims are patentable for depending on a patentable base claim.

In addition, with reference to the objection regarding claim 2, Applicants note that in Tsuji on page 10, text at the bottom of the page in reference to Figure 9, W is stated as being 5mm. The separation of the arms, 10W, would thus be 50mm. The values given in Tsuji are much larger by several orders of magnitude than the values of the present invention.

In reference to the rejection of claim 3, regardless of any fact that Tsuji and the claimed invention might both have a lower refractive index material between Y-branch arms, the fact remains that Tsuji does not teach a distinct separation between the two arms as taught by the claimed invention.

In reference to the rejection of claims 5, 6, 9 and 10, applicants restate that these claims are patentable for being dependent on a patentable base claims in view of the fact that they further limit the base claims.

THEREFORE, in view of the foregoing, applicants respectfully submit that Tsuji or Tsuji in view of Tanaka does not teach or suggest the claimed invention, and that the rejected claims are patentable over the cited art.

- B.** The Examiner has rejected claim 4 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, as applied to claim 1 above and further in view of Paatzsch et al. (WO97/32228). Applicants traverse the rejection.

Paatzsch et al., Figure 1 does not illustrate applicant’s widened discontinuity. The discontinuity shown in Paatzsch et al. is similar to that shown in applicants

Figure 2. As applicant states in Paragraph [0014], a Y-junction that exhibits the type of discontinuity results in an excitation into higher-order modes in the intermediate region, even in structures with adiabatic widening. In applicants' invention this type of higher-order excitation is avoided when the claimed invention is used. See applicants' Figure 4.

THEREFORE, in view of the foregoing, applicants respectfully submit that the combination Tsuji/Tanaka/Paatzsch does not teach or suggest the claimed invention, and that the rejected claim is patentable over the cited art.

- C. The Examiner has rejected claims 7 and 8 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, as applied to claim 6 above and further in view of Nakai (JP 9-230151). Applicants traverse the rejection.

In Nakai the outgoing waveguides are separated from the end of the incoming waveguide by a physical gap as evidenced by the space between L and G1. The claimed invention does not teach such gap. Consequently, applicants submit that Nakai adds nothing to the rejections over Tsuji and Tanaka because the Nakai waveguide is fundamentally different from the claimed invention.

THEREFORE, in view of the foregoing, applicants respectfully submit that the combination Tsuji/Tanaka/Nakai does not teach or suggest the claimed invention, and that the rejected claim is patentable over the cited art.

- D. The Examiner has rejected claim 11 under as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, as applied to claim 1 above and further in view of Burns (US Patent 4,070,092).

First, applicants reiterate that the combination of Tsuji and Tanaka does not teach or suggest the claimed invention for the reasons given above.

Second, with regard to Burns, while Burns teaches the use of lithium niobate, the Y-branch taught by Burns has no discontinuity or truncation as per the claimed invention. All figures in Burns show a sharp "VEE" at the point where the arms branch off.

THEREFORE, in view of the foregoing, applicants respectfully submit that the combination Tsuji/Tanaka/Burns does not teach or suggest the claimed invention, and that the rejected claim is patentable over the cited art.

- E. (i)** The Examiner has rejected claims 12 -17 20, 23, and 26 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, et al, Burns, Sawaki, et al (JP 58-211106) and Tangonan (US Patent No. 4,375,312). Applicants traverse the rejection.

First, with regard to Tsuji, Tanaka and Burns, applicants submit that these citations do not teach or suggest the claimed invention for the reasons given above.

Second, while Sawaki teaches forming a waveguide, Sawaki does not teach or suggest the formation of a Y-branch as taught and claimed by applicants; and in particular does not teach or suggest forming a Y-branch having a truncation as claimed. Consequently, applicants submit that the inclusion of Sawaki does not contribute to the obviousness of the claimed invention.

Third, While Tangonan teach forming a waveguide structure, Tangonan also does not teach or suggest the formation of a Y-branch as taught and claimed by applicants; and in particular does not teach or suggest forming a Y-branch having a truncation as claimed. Consequently, applicants submit that the inclusion of Tangonan does not contribute to the obviousness of the claimed invention.

THEREFORE, in view of the foregoing, applicants respectfully submit that the combination Tsuji/Tanaka/Burns/Sawaki/Tangonan does not teach or suggest the claimed invention, and that the rejected claims are patentable over the cited art.

- (ii)** With regard to the specific rejection of claims 14-17, and 23 over the combination Tsuji/Tanaka/Burns/Sawaki/Tangonan, these claims depend from independent claim 12. Applicants submit that they are allowable for depending on an allowable claim since that combination does not teach or suggest the base claims. These claims further limit the base claim.

- F.** The Examiner has rejected claims 18 and 19 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, et al, Burns, Sawaki, et al (JP 58-211106) and Tangonan (US Patent No. 4,375,312) as applied to claims 13 and further in view of Schaffner (US Patent 5,548,668). Applicants traverse the rejection.

Claims 18 and 10 are dependent claims on independent claim 12. Applicants submit that claim 12 is allowable in view of the arguments present above.

Applicants submit that claims 18 and 19 are allowable by reason of depending on an allowable claim and further limiting that claim.

**G.** The Examiner has rejected claims 21 and 22 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, et al, Burns, Sawaki, et al (JP 58-211106) and Tangonan (US Patent No. 4,375,312) as applied to claim 20 and further in view of Paatzsch. Applicants traverse the rejection.

Claims 21 and 22 are dependent claims on independent claim 20. Applicants submit that claim 20 is allowable in view of the arguments present above.

Applicants submit that claims 21 and 22 are allowable by reason of depending on an allowable claim and further limiting that claim.

**H.** The Examiner has rejected claims 24 and 25 as being unpatentable under 35 U.S.C. § 103(a) over Tsuji, et al in view of Tanaka, et al, Burns, Sawaki, et al (JP 58-211106) and Tangonan (US Patent No. 4,375,312) as applied to claim 20 and further in view of Nakai. Applicants traverse the rejection.

Claims 24 and 25 are dependent claims on independent claim 20. Applicants submit that claim 20 is allowable in view of the arguments present above.

Applicants submit that claims 24 and 25 are allowable by reason of depending on an allowable claim and further limiting that claim.

#### **4. Claim of Priority**

Applicants thank the Examiner for acknowledgement of claim for domestic priority under 35 U.S.C. §119(e). A copy of the certified copy is included with this response.

Based upon the above amendments, remarks, and papers of records, applicants believe the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Appl. No.: 10/091,092  
Amdt. Dated: June 18, 2004  
Reply to Office Action of: March 26, 2004

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Walter M. Douglas at 607-974-2431.

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Respectfully submitted,



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